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10/757,958	01/13/2004	Hiroshi Ogasawara	16869K-103400US	5071

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EXAMINER	
STEELMAN, MARY J	
ART UNIT	**PAPER NUMBER**
2191	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,958	OGASAWARA ET AL.	
	Examiner	Art Unit	
	MARY STEELMAN	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2007*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 11-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 11-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to amendments to the Claims and Specification, and Remarks received 02/01/2007. Per Applicant's request, the Specification has been amended. Per Applicant, request claims 9 and 10 have been cancelled. Claims 1-8 and 11-22 are pending.

Double Patenting

2. Terminal disclaimers, received 03/27/2007, over applications 10 / 757957 (USPN 7,155,595), 11 / 350484, and 11 / 010172 and USPN 6990553 have been approved.

Response to Arguments

3. Applicant's arguments with respect to claims 1-8 and 11-22 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8 and 11-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 7,171,452 B1 to Gole.

Per claim 1:

A method of installing software on a storage device controlling apparatus, said method comprising:

-writing software for enabling a file access processing section of a channel controller of the storage device controlling apparatus to function, wherein said storage device controlling apparatus comprises:

-a plurality of channel controllers, each having a circuit board on which are formed a file access processing section receiving requests to input and output data in files as units from an information processing apparatus via a first network and an I/O processor outputting I/O requests corresponding to said requests to input and output data to a storage device;

-a plurality of disk controllers executing input and output of data into and from said storage device in response to the I/O requests sent from said I/O processor;

-a second network coupling said plurality of channel controllers and said plurality of disk controllers so as to be able to communicate with each other,

-wherein said software is written into said storage device by communicating with said channel controller via said second network.

Gole: Col. 3: 24-27, A client 104 may be a general purpose computer, such as a PC or workstation, or a special purpose computer, such as an application server, configured (writing software for enabling a file access) to execute application over an operating system that includes block access protocols. Col. 3: 30-38, storage appliances configured to control (operating system software is written into said storage device) storage of and access (I/O requests via second network) to interconnected storage devices. Col. 3: 51-53, The disk shelves and storage systems may be operative interconnected in any suitable switching network topology (second network)

Col. 4: 19-21, A multi-protocol storage appliance is a computer having features such as simplicity of storage service management and ease of storage reconfiguration (install software, writing software) Regarding "writing software for enabling a file access processing section...to function", see col. 4: 36-67, The terms 'storage system', 'storage appliance' and 'file server' are thus used interchangeable. The storage appliance 200 also includes a storage operating system 300 that provides a virtualization function to logically organize the information...the memory 215 comprises storage locations that are addressable by the processor and adapters for storing software program code and data structures...the processor and adapters may, in turn, comprise processing elements and / or circuitry (channel controllers, disk controllers, information processing apparatus) configured to execute the software code and manipulate the data structures. Col. 4: 49, The storage operating system 300, portions of which are typically resident in memory and executed by the processing elements (channel controllers, disk controllers, information processing apparatus), functionally organizes the storage appliance by inter alia, invoking storage operations (enabling file access) in support of the storage service implemented by the appliance. Col. 4: 65, The network adapters 225a, b also couple the storage appliance 200 (first network) to a plurality of clients 104... Col. 6: 57-59, a general purpose operating system with configurable functionality, which is configured for storage applications...(installing software / enabling software)

Gole failed to specifically name such intermediary devices such as a disk controller and channel controller, I/O processor, circuit boards. However, Gole disclosed (col. 4: 46-58), "The processor and adapters may, in turn, comprise processing elements and / or logic circuitry

(processing elements / logic circuitry / devices such as a disk controller and channel controller, I/O processor, circuit boards) configured to execute the software code and manipulate the data structures…The storage operating system 300, portions of which are typically resident in memory and executed by the processing elements functionally organizes the storage appliance by, inter alia, invoking storage operations in support of the storage service implemented by the appliance. ..other processing and memory means, including various computer readable media, may be used for storing and executing program instructions pertaining to the inventive system and method described herein."

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify Gole's invention, to include specific examples of intermediary elements in a system that manages logical units of storage.

Per claim 2:

A method of installing software on a storage device controlling apparatus, said method comprising:

-writing a piece of firmware into each of nonvolatile memories provided for a channel controller and a disk controller of the storage device controlling apparatus, wherein said storage device controlling apparatus comprises:

-a plurality of channel controllers, each having a circuit board on which are formed a file access processing section receiving requests to input and output data in files as units from an

information processing apparatus via a first network and an I/O processor outputting I/O requests corresponding to said requests to input and output data to a storage device I/O;

-a plurality of disk controllers executing input and output of data into and from said storage device in response to the I/O requests sent from said I/O processor; and

-a second network coupling said plurality of channel controllers and said plurality of disk controllers so as to be able to communicate with each other, wherein said piece of firmware is written via said second network.

See rejection of limitations as addressed in claim 1 above. Regarding 'firmware', Gole disclosed firmware 370 at col. 8: 6. See FIG. 3.

Gole failed to specifically name such intermediary devices such as a disk controller and channel controller, I/O processor, circuit boards. However, Gole disclosed (col. 4: 46-58), "The processor and adapters may, in turn, comprise processing elements and / or logic circuitry (processing elements / logic circuitry / devices such as a disk controller and channel controller, I/O processor, circuit boards) configured to execute the software code and manipulate the data structures...The storage operating system 300, portions of which are typically resident in memory and executed by the processing elements functionally organizes the storage appliance by, inter alia, invoking storage operations in support of the storage service implemented by the appliance. ..other processing and memory means, including various computer readable media, may be used for storing and executing program instructions pertaining to the inventive system and method described herein."

Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify Gole's invention, to include specific examples of intermediary elements in a system that manages logical units of storage. One of ordinary skill would understand that writing code to a device, to be used in such an invention, comprises 'writing to firmware', basically configuring, or reconfiguring a piece of hardware.

Per claim 3:

-wherein a storage area for storing the software for enabling said file access processing section of said channel controller to function is assigned in said storage device; wherein said storage device controlling apparatus is coupled to a host via a SAN.

Gole: Col. 4: 65-col. 5:38, SAN, block based access protocols.

Per claim 4:

-said software for enabling said file access processing section to function is software for implementing a function of an operating system that provides a function of a file system.

Gole: Col. 5: 43-45, The storage adapter includes I/O interface (software for implementing a function...provides a function of a file system) Col. 6: 38-59, the term storage operating system generally refers to the computer executable code operable on a computer that manages data access (enabling said file access processing section to function) and may in the case of a filter or storage appliance, implement data access semantics...

Per clam 5:

-said second network is coupled to a computer, and said software is written from said computer into said storage device by said channel controller communicating with said computer, wherein said storage device controlling apparatus receives data requests in block units based on fibre channel protocol.

Gole: Col. 5: 43-45, The storage adapter includes I/O interface circuitry (second network) that couples to the disks over an I/O interconnect arrangement Col. 5: 10-26, SAN and 'block based access protocols

Per claim 6:

-said second network is coupled to a computer, said method further comprising:

storing, by said computer, information for identifying at least one specific channel controller with which said computer is to perform said communication from among said at least one channel controller;

-writing said software from said computer into said storage device by said computer communicating with said at least one specific channel controller about which said information is stored in said computer.

Gole: Col. 6: 10-26, To facilitate access to the disks, the storage operating system 300 implements a write anywhere file system that cooperates with novel virtualization system code to provide a function that virtualizes the storage space...logically organizes the information...providing an integrated NAS and SAN appliance approach to storage by enabling file based (NAS) access to the files and directories, while further emulating block based (SAN)

access to the vdisks... Col. 7: 23-24, A Virtual Interface (VI) layer 326 implements the VI architecture to provide direct access transport (DAT) capabilities

Per claim 7:

-said pieces of firmware are sent from a computer coupled to said second network to said channel controller and said disk controller wherein said storage device controlling apparatus receives data requests in block units based on fibre channel protocol.

Gole: firmware, FIG. 3, #370 Col. 3: 20, FCP devices (fibre channel devices) Col. 6; 65 – col. 7:10, Block access, Fibre Channel switching network 102.

Per claim 8:

-said second network is coupled to a computer, said method further comprising:

-storing, by said computer, information for identifying at least one specific channel controller and at least one specific disk controller with which said computer is to perform said communication from among said at least one channel controller and said at least one disk controller;

-writing said pieces of firmware from said computer into said at least one specific channel controller and said at least one specific disk controller by said computer communicating with said specific channel controller and said specific disk controller about which said information is stored in said computer.

Gole: Col. 5: 43, I/O interface circuitry Col. 6: 9-35, To facilitate access to the disks (storing, writing), the storage operating system 300 implements a write anywhere file system that

cooperates with novel virtualization system code …logically organizes…disk blocks configured to store information..providing an integrated NAS and SAN appliance approach to storage Firmware (col. 8: 6)

Per claim 11:

-the software written into the storage device enables the channel controller to function in a way that enables a storage system in which the storage device controlling apparatus is disposed to function as a Network Attached Storage (NAS).

Gole: Col. 4:23, NAS

Per claim 12:

-wherein the software written into the storage device comprises an operating system that enables the channel controller to function as a NAS channel controller.

Gole: Col. 6:37-59 Gole: Col. 4:23, NAS

Per claim 13:

-the firmware written into the nonvolatile memories of the channel controller and the disk controller enables the channel controller and the disk controller to function in a way that enables a storage system in which the storage device controlling apparatus is disposed to function as a Network Attached Storage (NAS).

Gole: Col. 4:23, NAS

Per claim 14:

-the firmware written into the nonvolatile memory of the channel controller comprises a microprogram for controlling the I/O processor of the channel controller.

Gole: Col. 6:37-59, operating system (microprogram for controlling the I/O processor of the channel controller) , a general purpose operating system with configurable functionality, which is configured for storage applications. Col. 5:23-25, configured to respond to the requests issued... (I/O)

Per claim 15:

-the firmware written into the nonvolatile memory of the disk controller comprises a microprogram for controlling a CPU of the disk controller.

Gole: FIG. 3, #370

Per claim 16:

-the firmware written into the nonvolatile memory of the channel controller comprises a loader and an installer used by the channel controller to install an operating system into storage device for enabling the file access processing section to function.

Gole: Col. 4: 43-58, memory 215 comprises storage locations that are addressable by the processor and adapters for storing software program code and data structures associated with the present invention...elements and / or logic circuitry (channel controller) configured to execute the software code and manipulate the data structures...including various computer readable

media, may be used for storing (loading / installing) and executing program instructions pertaining to the inventive system and method described herein.

Per claim 17:

-installing the operating system into the storage device for enabling the file access processing section to function as a NAS channel controller.

Gole: Col. 4:23, NAS

Per claim 18:

-writing software for enabling the file access processing section to function, the software being written into the storage device by communicating with the channel controller via the second network.

Gole: Gole: Col. 4: 43-58, memory 215 comprises storage locations that are addressable by the processor and adapters for storing software program code and data structures associated with the present invention…elements and / or logic circuitry (channel controller) configured to execute the software code and manipulate the data structures…including various computer readable media, may be used for storing (writing software into the storage device) and executing program instructions pertaining to the inventive system and method described herein.

Per claim 19:

-the second network comprises an internal LAN in the storage device controlling apparatus.

Gole: Col. 3: 32-38, Each of the devices attached to the switching network 102 includes an

appropriate conventional network interface arrangement for communicating over the switching network 102, or through the switches 106 and 108 using a set of desired file (LAN) or block access protocols

Per claim 20:

-the at least one channel controller and the at least one disk controller are further connected by a connecting section to a memory via a high-speed bus.

Gole: Col. 3: 32-38, Each of the devices attached to the switching network 102 includes an appropriate conventional network interface arrangement for communicating (high speed bus) over the switching network 102, or through the switches 106 and 108 using a set of desired file or block access protocols

Per claim 21:

-the second network comprises an internal LAN in the storage device controlling apparatus.

Gole: Gole: Col. 3: 32-38, Each of the devices attached to the switching network 102 includes an appropriate conventional network interface arrangement for communicating over the switching network 102, or through the switches 106 and 108 using a set of desired file (internal LAN) or block access protocols

Per claim 22:

- the at least one channel controller and the at least one disk controller are further connected by a connecting section to a memory via a high-speed bus.

Gole: Col. 3: 32-38, Each of the devices attached to the switching network 102 includes an appropriate conventional network interface arrangement for communicating over the switching network 102 (connected by a connecting section), or through the switches 106 and 108 using a set of desired file or block access protocols

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Steelman, whose telephone number is (571) 272-3704. The examiner can normally be reached Monday through Thursday, from 7:00 AM to 5:30 PM If

attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached at (571) 272-3708. The fax phone number for the organization where this application or proceeding is assigned: 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary Steelman

04/12/2007